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CRITICAL NOTES ON NEW AND OLD GENERA OF PLANTS.—VIII.

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LIBERTELLA AND LIBERTIELLA

The name *Libertella and Libertiella* are but alternate forms of a diminutive of *Libertia*. In any logical and serious system of plant nomenclature neither diminutive would be tolerated because there is a *Libertia* already. Still our modern works of mycology tolerate even these two diminutives for very different plants of closely related orders. *Libertiella* appearing to be the later proposed may be supplanted by *Shecutia* in honor of John Shecut[1] a botanist who wrote a flora of the Carolinas.

Shecutia Nom. Vov.
Libertiella Speg. & Roum. not *Libertella* Desn.
Shecutia malmedyensis (Speg. and Roum).
Libertiella malmedyensis Speg. & Roum.

MAGNUSIA Sacc.

The *Magnusia* Sacc. was anticipated by Klotsch's[2] plant of the same name. The fungus name may be replaced by **Kernia**

Kernia Nom. Nov.
Magnusia Sacc., Syl. 1: 38.
Kernia nitida (Sacc.) Nov. Comb.
Magnusia nitida Sacc.

MACROPODIA.

Otto Kuntze[3] had already pointed out that the *Macropodia* Fuckel (1869) is invalidated by *Macropodium* R. Br.[4] In fact

[1] Shecut J., Fl. Caroliniaensis (1806).
[2] Klotsch, J. F., Monatsb. Berl. Acad. March 125 (1854).
[3] Kuntze O. Revisio Gen. Pl., I, 852 (1891).
[4] Brown, R. in Ait. Hort. Kew. ed. II, IV, 108 (1812).

another *Macropodia* Benth[1] (1873) had also been slipped into print. Kuntze in attempting to supersede Fuckel's name by calling the fungus *Fuckelina* overlooked the fact that that there was a *Fuckelina* Sacc. Thus invalidating his own new nomenclatorial creation. To replace *Macropodia* Fuckel (=*Fuckelina* Kuntze) **Cowlesia** may be applied.

Cowlesia Nom. Nov.

Macropodia Fuckel (1869) not *Macropodium* R. Br. (1812). *Fuckelina* O. Kuntze (1891) not *Fuckelina* Sacc.

Cowlesia Corium (Weberb.) Nov. Com.

Macropodia Corium (Weberb) Cooke, *Peziza Corium* (Weberb.)

Cowlesia macropus (Pers).

Peziza macropus Pers.

Cowlesia bulbosa (Hedw.).

Peziza bulbosa (Hedw.) Nees.

MAURYA

Maurya Pat. is too much like *Mauria* Kunth[2] (1824) which antedates the fungus name. This should then be changed and *Pluesia* may be suggested in honor of M. Plues, author of works on English Botany.

Pluesia Nom. Nov.

Maurya Pat. not Mauria *Kunth.* (1824) (Anacardiaceae).

Pleusis hypoxyloidea Nov. Comb.

Maurya hypoxyloidea Pat.

MONOCHAETIA Sacc.

Monochaetia used as a subgenus but adopted by Clements[3] as a genus is for all purposes the same word with the same derivation as *Monochaetum*[4] Naud (1845) or *Monochaete* Doel[5] (1878). One does not make a new name by changing its gender ending. **Lennisia** may replace the fungus of that name.

Lennisia Nom. Nov.

Monochaetia (Sacc.) not *Monochaetum* Naud (1845).

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[1] Bentham, G. Fl. Austral. VI, 447 (1873).

[2] Ann. Sc. Nat. Ser. I, II, (1824).

[3] Clements F. E., Genera of Fungi, 137 (1909).

[4] Naudin. Ann. Sc. Nat. Ser. III, IV, 48 t2 (1845).

[5] Doell., Mart. Fl. Bras. II, III, 78, t. 22 (1878).

MORINIA

There is a Linnaean genus *Morina* which renders the *Morinia* Berl. and Bres. a homonym, for the reason mentioned in the preceeding paragraph. This latter may be changed to *Rinomia*. A synonym thereto may be seen in *Pestalozzina* Passer, but there is another *Pestalozzina* Sacc., also a *Pestaloziella* Sacc. & Ell., *Pestalozia* de Not. and a *Pestalozzia* Zoll. & Mor. (1846).

Rinomia Nom. Nov.

Morinia Berl. & Bres. not *Morina* Linn.

Rinomia pestalozziodes (Berl. & Bres.).

MYXONEMA

Myxonema Freis (1825), presumed to be but a synonym of *Stigeoclonium* Kutz. (1843) has been taken up for the latter.[1] The *Myxonema* Corda is therefore of course a homonym. This fact illustrates that when once a genus name has been used, it is never safe to apply it to another plant on the plea that it is available because of invalidity of the first or its desuetude. "Once a synonym always a synonym," is the only safe principle to apply to nomenclature if absolute confusion is to be avoided. *Pyonema*, may be suggested to supplant Corda's untenable name.

Pyonema Nom. Nov.

Myxonema Corda, not *Myxonema* Fries (1825).

Pyonema assimile (Corda).

Myxonema assimile Corda.

NOLANEA

Nolanea (Fries.) Sacc is but another form of *Nolana* Linn. To replace it **Lanolea** may be applied for the fungus.

Omphalia Fries is too much like *Omphalea* Linn. (1759). **Phalomia** may be used for the fungus plant.

PECKIA

Besides a *Peckia* Vell.[2] 1825 there is also a *Peckiella* Sacc. and a *Neo–Peckia* Sacc. The fungus name *Peckia* Clinton is antedated. **Macilvainea** may be used, in honor of Charles McIlvaine author of a popular work on American fungi.

Macilvainea Nom. Nov.

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[1] West, G. S., Treatise of the British F. W. Algae, (1904).

[2] Velloso J., Fl. Flum. 51; Ic. I. t 134, 135 (1825).

Peckia Clinton not *Peckia* Vell., (1825).
Macilvainea Sarraceniae (Peck and Clint.).
Peckia Sarraceniae Peck & Clinton.

PILOCARPUM

Pilocarpus Vahl[1] renders *Pilocarpon* Wainio, called by some *Pilocarpum* Clements,[2] a synonym. Changing the gender of an existing name ending does not constitute a new name. *Wainioa* may be applied in honor of the author of the fungus genus used as a homonym.

Wainioa Nov. Nom.[3]
Pilocarpon Wainio, not *Pilocarpus* Vahl. (1796).
Wainioa leucoblephara (Wainio).
Pilocarpon leucoblepharum (Wainio).

PIPTOSTOMA AND PIPTOSTOMUM.

When we consider how readily and easily and without attempts at explanation even mycologists change the endings of words e. g., from *on* to *um* etc., and that too without consciously seeming to consider that they have made any essential variation in a name, we wonder that the converse of this is lost sight of. *Pilocarpum* Clements is the same as *Pilocarpon* Wainio, and no objection is made, and they are at liberty considered interchangeable. On the other hand there is a *Piptostoma* Besk. and Br. and a *Piptostomum* Lev. and no one seems to object that they are the same word. If interchangeable in one case they are identical. No two distinct plants ought to have the same name. If besides we find such two in the same work and both recognized, we have a right to feel surprised at the slipshod methods of mycological nomenclature, as much as at the logic or lack of it that permits a thing in one case and forbids it in another.

PIPTOCEPHALIS

Piptocephalum Sch.[4] and *Piptocephalis* are homonyms in spite of different endings. **Mucoricola** may be used for the fungus.

[1] Vahl. Ecolog. 1. 29, t 10, (1796).

[2] Clements, F. E., Genera of Fungi, 76 (1909).

[3] Should there be a *Wainioa* already we may use as alternate the name *Limbalba*.

[4] Bonplandia VIII, 369 (1860).

PILOPHORUM

This name *Pilophorum* is another example of one whose ending is indifferently used as *on* or *um* or even goes as *Philophorus* Nyl. Though there is an older *Philophora Jacq.*[1] Nevertheless the name of the fungus later used finds its way in all our books on these plants, and that too with the variations shown! This inconsistency, moreover, does not seem to affect the matter in the least. We suggest the name **Crinofera** for the homonymous fungus name.

POLYCEPHALUM

Polycephalos Forsk[2] is an older name than the *Polycephalum* Kalchb. & Cooke. *Gremlia* may be used for the fungus homonym, in honor of August Gremli, author of a work on the flora of Switzerland.

Gremlia Nov. Nom.

Polycephalum Kalchbr. & Cooke, not *Polycephalos* Forsk.

Gremlia aurantiaca (Kalchbr. & Cooke).

Polycephalum aurantiacum Kalchbr. & Cooke.

PTERYGIUM Nyl.

Pterygium Nyl. can not remain as the Lichen name because of an older *Pterygium* Endl.[3] also written *Pterigium* by Correa.[4] To replace it may be suggested *Calkinsia* in honor of W. W. Calkins a most zealous student and collector of American lichens. The plant had been called *Wilmsia* but there was another plant claiming that name.

Calkinsia Nom. Nov.

Pterygium Nyl. not *Pterygium* Endl. (1847) nor *Pterigium* Correa (1806) l. c. *Wilmsia* Körb. not Lahm = *Pachyphiale* Lönnr.

Calkinsia subradiata (Nyl.).

Pterygium subradiatum Nyl.

Calkinsia panariella (Nyl).

Pterygium panariellum (Nyl).

PYTHIUM

Pythium Pringsheim would appear to be invalid because of

[1] Frag. 32 t 35, (1800) Also *Pilophoron*.

[2] Forskal, Fl. Aegyp-Arab. 154 (1775).

[3] Endlicher. Gen. 1013 (1841).

[4] Correa. Ann. Mus. Par. VII, 397 (1806).

the older *Pythion* Mart[1] (1831) which is but an alternate Greek writing of the other, the Latin form. There is, moreover, an older *Pythius* Raf.[2] (1836). We rename the group *Eupythium*, raising the typical section name to generic standing. *Artotrogus* Montagne, was not selected apparently as a name for the aggregate, but for the typical section of it and in our opinion is ineligible, because it might sometime be required for a separate genus name.

Eupythium Nom. Nov.

Pythium Pringsheim, not *Pythion* Mart., (1831) nor *Pythius* Rafinesque, (1836).

Eupythium proliferum (De Bary).

Pythium proliferum DeBary.

Eupythium debaryanum (Hesse).

Pythium De Baryanum Hesse.

Eupythium sadebeckianum (Wittmack).

Pythium sadebeckianum Wittmack.

Eupythium Anguillulae (Sadebeck).

Pythium Anguillulae Sadebeck.

ROBERGEA.

Robergea Desmaz. is scarcely different from *Robergia* Schreb.[3] and in any system of pronunciation of names can not be distinguished. As the pronounced name constitutes the homonym in spite of spelling, the fungus name must yield to the older one. *Bergorea* may be substituted.

Bergorea Nom. Nov.

Robergea Desmaz. not *Robergia* Screb.

Bergorea unica (Desmaz).

Robergea unica Desmaz.

Bergorea albifrons (Tulas).

Robergea albifrons Tulas.

SCOPULARIA

Scopularia Preuss, according to the laws of priority must give way because of the existence of an older *Scopularia* Lindley[4] (1834.) *Lindavia*[5] is suggested as a substitute for the fungus plant.

[1] Martius, Flora XIV, 459 (1831).

[2] Rafinesque, C. S., Fl. Tell., IV, 116 (1836).

[3] Schreber, Gen. 309 (1789).

[4] Lindley J., Bot. Reg. Sub. t. 1701 (1834).

[5] In case *Lindavia* be already used *Outhovia* may be substituted as an alternate.

Lindavia Nom. Nov.
Scopularia Preuss, not Lindley (1834).
Lindavia venusta (Preuss).
Scopularia venusta Preuss.

SCUTULA

The name *Scutula* for a fungus can not remain as there was a plant of that name used by Loureiro.[1] For the plant in the Patellariaceous family **Spilodium** Mass. should be used.

Spilodium epiblastimaticum (Wallr.)
Scutula epiblastimatica (Wallr.) Rehm.
Spilodium Stereocaulorum (Th. Fr.)
Scutula Stereocaulorum (Th. Fr.) Korb.

SPHAEROCEPHALUM

Sphaerocephala Hill.[2] is an older application than *Sphaerocephalum* Wiggers.[3] The genus of Lichens may be designated **Descemetia** in honor of the author of a medical flora of the 18th century, Jean Descemet.

SPHAEROTHECA

Sphaerotheca Lev. should give way because of the older *Sphaerotheca* Cham & Schecht.[4] Leveillé's plant may be called *Destangsia* after Stanislaus Desetangs, author of a work on popular names of plants.

Desetangsia Nom. Nov.
Spaerotheca Lév. not Chan & Schecht. l. c.
Desetangsia Humuli (DC.).
Sphaerotheca Humuli DC. Schröt.
Desetangsia Epilobii (Link) Sacc.
Sphaerotheca Epilobii (Link) Sacc.
Destangsia Mors Uvae (Schwein).
Sphaerotheca Mors-uvae (Schwein) Berk. & Cort.
Desetangsia Drabae (Juel).
Sphaerotheca Drabae Juel.

TONINIA

Toninia (Mass.) Th. Fr. is really the same name as *Tonina*

[1] Loureiro, Fl. Cochin Chin., 235 (1790).
[2] Hill. J., Veg. Syst. IV, 48 (1762).
[3] Wiggers (Weber G. H.) F. H., Pr. Fl. Holsat., 87 (1780).
[4] Chamisso A. v. Schechtendal D. F. L., Linnaea II, 605 (1827).

Aubl.[1] (1775) the latter many decades older. *Syncomista* the specific name of one of the species seems appropriately adapted for generic caption of the group.

Syncomista Nom. Nov.
Toninia (Mass.) Th. Fr. not Aublet (1775) l. c.
Syncomista cinereovirens (Schaer).
Toninia cinereovirens (Schaer) Mass.
Syncomista squarrosa (Ach).
Toninia squarrosa (Ach) Th. Fr.
Syncomista aromatica (Sm.)
Toninia aromatica (Sm.) Mass.
Syncomista humicola Nom Nov.
Toninia syncomista (Fl. K.) Th. Fr.

SPHAEROSPORA

Sphaerospora Sacc. is antedated by a *Sphaerospora* Sweet[2] and must be changed. *Rubelia* may be used instead of Saccardo's name. F. Rubel wrote on *Agaricus* in the 18th century.

Rubelia Nov. Nom.
Sphaerospora Sacc. not Sweet l. c.
Rubelia trechispora (Berk. & Br.).
Sphaerospora trechispora Berk. & Br.
Rubelia confusa (Cooke).
Sphaerospora confusa (Cooke) Sacc.
Rubelia Barlae (Boud).
Sphaerospora Barlae (Boud) Sacc.
Rubelia verruculosa (Berk. & Br.).
Spherospora verruculosa (Berk. & Btt.). Sacc.

KABATHIA

Kabathia[3] suggested by us as a substitute for *Darluca* Cast. is too much like the fungus name *Kabatia* (*Hyaldidymae*,) *Leptostomataceae*). **Mycepimyce** may be used for our *Kabathia* whose homonymy was inadvertently overlooked by us.

[1] Aublet, F., Pl. Gui. II, 856, t 330 (1775).
[2] Sweet R., Hort. Britt. ed. I, 398 (1827).
[3] Am. Mid. Nat. IV, 377, (1916).

THE NAIADES OF MISSOURI.—VI.

BY WILLIAM I. UTTERBACK.

Lasmonos simpsoni (Ferriss).
(Simpson's Shell.)
Pl. XXVI, Figs. 91 A and B.

1900—*Lampsilis simpsoni* Ferriss, Nautilus, xiv, p. 38.

ANIMAL CHARACTERS unknown to writer.

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell subovate, elongated, subsolid, narrowly rounded in front, broadly rounded behind, somewhat alated; disk smooth; beaks low, sculptured by ridges somewhat corrugated and nodulous; epidermis tawny with green rays with rather roughened growth lines; hinge line evenly curved.

INTERNAL STRUCTURES:—Cardinals reduced to mere stumpy rudiments; laterals single in right, very faintly double in left valve; anterior scars rather deep, posterior shallow; nacre bluish shaded with violet, copper or pink.

Sex	Length		Height		Diameter	Locality
♂	78	x	46	x	28mm.	(White R., Hollister)
♀	95	x	50	x	22 "	(" " ")

MISCELLANEOUS REMARKS:—No juveniles, nor young shells, have been obtained by the writer in this State. However, Mr. Ferriss, the author, has obtained a good suite from Spring River, Hardy, Arkansas, and has described the young shells as possessing an epidermis with green rays and "coppery beaks," a well marked post-umbonal ridge and low but distinct beaks with coarse corrugations. The author of this species, groups it between *Lasmonos fragilis* and *leptodon*. From the former it may be distinguished by a thicker more elongated shell, by more reduced hinge teeth and less varigated nacre and from the latter by being more inflated, wider, thicker, not so pointed posteriorly and with fewer rays. Hence its place can be fairly well determined conchcologically. Future studies of its marsupial and glochidial characters of this species, as well as that of *leptodon* (=*S. teniussimus* Lea), may classify it far differently, since shell characters are too liable for parallelism and convergence as true bases of classification.

Lasmonos leptodon? (Rafinesque).

Not Figured.

1820—*Unio* (*Leptodea*) *leptodon* Rafinesque, Ann. Gen. Sci. Phys. Brux., p. 295, Pl. LXXX.

1829—*Symphynota tenuissima* Lea, Tr. Am. Phil. Soc., III, p. 435, Pl. XI, Fig. 21.

This species is listed here on the strength of reports of its occurrence in the Mississippi and Neosho Rivers of this State. From a shell, (measuring 58x31x14mm.), received from Michigan through exchange, the author is able to make comparisons and thus concur with the general assumption that it should group under *Lasmonos*. However, superficial observations would group it near *Lastena ohiensis*, but presence of hinge teeth, although not well developed, and also different beak sculpture would sufficiently separate it. Surely the "clear water streams" of South Missouri may also yield specimens of this species since the same rivers that reach up into Missouri are reported to bear it in Arkansas. Scammon (1906, pp. 304 and 305) reports it for Kansas and Simpson describes its general range for the upper Mississippi drainage south to the Tennessee River and for Southern Michigan.[1]

Genus **Proptera** Rafinesque.

1819—*Proptera* Rafinesque, Monog. An. Gen. Sci. Phys. Brux.;—1900b, Simpson, Pr. U. S. Nat. Mus., XXII, p. 566, (as sub genus); 1912b, Ortmann, An. Car. Mus., VIII, p. 332.

(Type, *Unio alatus* Say)

ANIMAL CHARACTERS:—Branchial opening with dense papillae; anal crenulated; supra-anal small, moderately closely connected to anal; inner laminae entirely connected to visceral mass; palpi only slightly antero-dorsad; marsupia reniform occupying posterior part of outer gills, consisting of several ovisacs; conglutinates not solid, broken; glochidium ax-head or celt-shape, usually armed with two spines at each corner of ventral edge of each valve; mantle border antero-ventrad to branchial opening slightly lamellar with crenulations only.

SHELL CHARACTERS:—Shell subelliptic or subovate, solid to thin, strongly alated post-dorsad; disk smooth; hinge fairly well

[1] The presence of *L. leptodon* in Missouri need not be so questionable now because of A. A. Hinkley's recent report of it in the James River at Galena this State. (Dec. 23, 1915, Pr. U. S. Nat. Mus., Vol. 49, p. 588.)

developed; beaks low, sculptured by the early bars of fine concentric arrangement and later one of double-looped type—sometimes rather nodulous at base of post ridge; sexually dimorphic, the female shell being wider posteriorly by the expansion of the post-ventrad edge of shell.

MISCELLANEOUS REMARKS:—With the exception of unique glochidium and more developed hinge this genus stands with *Lasmonos*. *Proptera* is represented in this state by the four species: *alata*, which is found mostly in Central Mo., *purpurata* which only occurs in South Mo., *laevissima* which is mostly restricted to North Mo., and *capax* which is entirely confined to the Mississippi River. The last named species has not been definitely settled within any genus before on account of a lack of an exact determination concerning the morphology of its animal. The extreme inflation of the *capax* shell, as compared to the compressed-type of the other members of this genus, would seem to shut it out, but glochidial and marsupial characters (besides its similar beak sculpture) are by far more reliable affinities. All the members of this most sharply defined genus are long period breeders.

Proptera alata (Say).

("Razor Back," "Rudder Back," "Hatchet Back," "Pan Cake.")

Pl. IV, Fig. 11a.

1816—*Unio alatus* Say, Nich, Encyc., II, pl. IV, fig. 2.
1898—*Lampsilis alatus* Baker, Moll. Chicago, Pt. I, p. 97, pl. XVIII.
1912b—*Proptera alata* (Say) Ortmann, An. Car. Mus., VIII, p. 333.

ANIMAL CHARACTERS.

NUTRITIVE STRUCTURES:—Branchial and anal openings inclined to tubular structure, branchial upcurved, small with numerous papillae; anal smooth thick edges; supra-anal large thick and close mantle connection to anal; inner laminae of inner gills entirely connected to visceral mass; palpi about as wide as long, connected about one-half of their length antero-dorsad; color of soft part tan-flesh color with dark mantle edges and orange colored cerebral ganglion.

REPRODUCTIVE STRUCTURES:—Marsupia large, occupying posterior half of outer gills, consisting of large ovisacs sulcated ventrad mantle edge antero-ventrad to branchial opening lamelar with

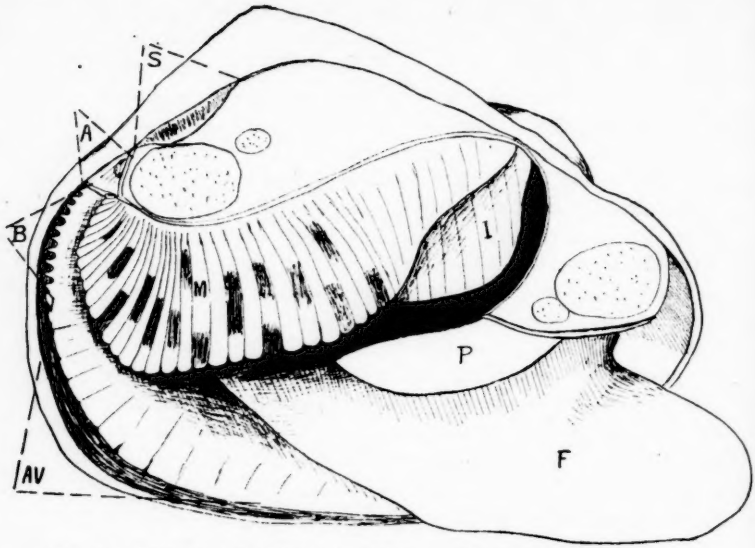

FIG. 8. *Proptera alata* (Say) ♀. Diagram of a gravid individual from Platte River, Agency Ford, showing animal characters in left valve. Coll. June 7, 1913. (¾ Nat. size.)

crenulations; conglutinates large, broken with ova or glochidia all through the mass; glochidia large, ax-head shape, with spine at each ventral corner of shell (0.220 x 0.380 mm.).

FIG. 9a. Lateral view of mature glochidium of *P. alata*. (x87.)

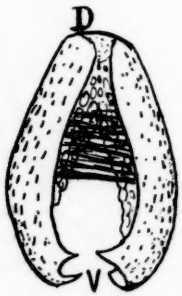

FIG. 9b. Anterior view of open glochidium of *P. alata*. (x87.)

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell large broadly elliptical, solid alated post-dorsad; somewhat inflated at middle of disk, beaks low sculptured concentrically and also double-looped; disk not sculptured; epidermis usually black-reddish with broad rays in young specimens; female shells blunt, or even truncate, vertically for its posterior end.

INTERNAL STRUCTURES:—Cardinals erect-double in both valves; laterals also double placed at an upward angle; beak cavities moderately deep; nacre usually purple.

Sex	Length		Height		Diameter	Locality
♀	156	x	117	x	56.5	(Platte, R., Dixon Falls)
♂	150	x	114	x	53.0	(" ' Platte City)
♀	115	x	55	x	33.0	(Osage R., Warsaw)
♀	82	x	54	x	26.0	(Grand R., Utica)

MISCELLANEOUS REMARKS:—This species is most typical in North Missouri; the shell is thinner, smaller and rather dwarfed in Central Missouri and is wholly lacking in South Missouri drainage. The writer has only found *alata* lacustrine on one occasion, but that may have been due to accidental translocation. Breeding records show it to be bradytictic. The writer has observed that most marsupia of this species, when gravid with ripe glochidia, have purplish blotched marsupia; this character, however, is rather inconstant. *Alata* has a general distribution throughout the Mississippi and St. Lawrence River basins.

Proptera purpurata (Lamarck).

("Purple Shell," "Purply," "Buttermilk Shell," Red Shell.")

Pl. XXVI, Figs. 92 A—D.

1819—*Unio purpurata* Lamack, An. Sans. Vert., VI, p. 71.

1900b—*Lampsilis purpuratus* Smpson, Pr. U. S. Nat. Mus., XXII, p. 568.

1912b—*Proptera purpurata* (Lam.) Ortmann, An. Car. Mus., VIII, p. 234.

ANIMAL CHARACTERS.

NUTRITIVE CHARACTERS:—Identical with those of *alata*.

REPRODUCTIVE STRUCTURES:—Marsupium consists of twenty ovisacs placed in posterior half of outer gills; glochidia (according to Lea) ax-head shape—no measurement given.

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell large, rather elongate—ellip-

tical, inflated; disk smooth; beaks high and full; post dorsal ridge somewhat alated; post umbonal ridge biangulated; epidermis glossy black.

INTERNAL STRUCTURES:—Cardinals double in both valve; laterals prominent, blade-like; umbonal and branchial cavities deep and rounded out; nacre rich purple.

Sex	Length		Height		Diameter	Locality
♂	120	x	75	x	53mm	(White R., Hollister)
♀	125	x	70	x	44mm	(" " Forsyth)
♂	83	x	56	x	40mm	(" " Hollister)
♀	70	x	47	x	34mm	(" " ")

MISCELLANEOUS REMARKS:—The young shells of *P. purpurata* are thin and fragile but later become thick and solid; resembling *alata* in form and nacre but is more so alated not compressed. This shell only appears in the White and Neosho River basins and is one of the few not found in the Mississippi. Its favorite habitat is deep water and mud bottoms. It is hoped its glochidium may be verified and more proportionate measurements given than Lea was able to record.

Proptera laevissima (Lea).

("Paper Shell," "Double Wing.")

Pl. IX, Figs. 19 and 20; Pl. XXVI, Figs. 94 A—D.

1830—*Symphynota laevissima* Lea, Tr. Am Phil Soc., III, p. 444, pl. XIII, fig. 23.

1900b—*Lampsilis laevissima* Simpson, Pr. U. S. Nat. Mus., XXII, p. 574.

1912b—*Proptera laevissima* (Lea) Ortmann, An. Car. Mus., VIII, p. 334.

ANIMAL CHARACTERS

NUTRITIVE STRUCTURES:—Branchial and anal openings very tubular, directed away from each other; anal smooth; supra-anal high, well separated from anal by mantle connection; inner laminae of inner gills entirely connected to visceral mass; palpi broader than long, connected about one-half of the length antero-dorsad; color of soft parts a modest tan, except for mantle edges at siphonal openings and the area over nephridium.

REPRODUCTIVE STRUCTURES:—Marsupium large, kidney-shaped occupying over half of posterior part of outer gills and consisting 50–60 narrow ovisacs somewhat distended transversely

and very much so ventrad from original edge of sterile marsupium, ventral tips of ovisacs teat-like, not colored; conglutinates white, discharged in broken disintegrated masses; glochidium ax-head shape or celtiform, small with spine-like structures measuring 0.100 x 0.155mm; branchial mantle edge thickened, lamellar, but without palpilae.

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell elliptical compressed, thin, bialated, post-ala being drawn near to the beaks in definite lobes of growth, sometimes curved laterally; disk without any sculpture; post-umbonal ridge absent, female shell swollen post-ventrad; epidermis brown-glistening horn-color with faint rays and areas of indigo blue especially on post wing; beaks low, suppressed sculptured with a few fine concentric lines and a row of three small tubercles on line with a post-ridge.

INTERNAL STRUCTURES:—Cardinals thin, erect, double in right, single in left valve, laterals rather reduced; scars somewhat faintly impressed; beak and branchial cavities rather shallow; nacre solid purple.

Sex	Length		Height		Diameter	Locality
♂	150	x	105	x	42mm	(102 R., St. Joseph)
♂	145	x	90	x	39mm	(Mud Lake, Kenmoor)
♀	137	x	89	x	37mm	(Platte, R., Agency Ford)
♀	41	x	23	x	12mm	(Lake Contrary, St. Joseph)

The last measurement of a juvenile—*the youngest and smallest Naiad shell ever found gravid by the writer.* Its glochidia were normal. Many of these juveniles are in the writer's cabinet, having been collected in "nests" from L. Contrary for the most part. The shells are like those of ground glass in color and transluscent both externally and internally. Beaks are rather apiculated and marked by rather coarse concentric ridges with three teat-like tubercles arranged in a row on line with post-ridge, resembling juvenile beak sculpture of *Lasmonos.*

MISCELLANEOUS REMARKS:—This species may represent the critical transition period from the primitive to the actual modern forms. Its glochidium is not a true *Proptera form in not* possessing typical spines at the ventral corners of its valves. Coker and Surber (1911, pp. 179–182) have pointed out its metamorphosis in the parasitic life as eccentric in that the glochidium remains

intact as a saddle over the beginning of its adult shell. No species, perhaps, has such tubular development of mantle edges for the branchial and anal openings. In this state its distribution is peculiar, being almost exclusively found in North Missouri and never in South Missouri. It is often found in company with *alata* from which it can be separated on account of thick shell and coarser epidermis of the latter. It may be mentioned here that *laevissima shows the highest modern development of the siphonal openings, i. e., into the actual tubular form.* (See Plate IX). This Species is distinctly bradytictic.

Proptera capax (Green).

("Pocket Book," "Swell Shell.")

Pl. XXVI, Figs. 93 A and B.

1832—*Unio capax* Green, Cab. Nat. Hist., II, p. 290.
1899—*Lampsilis capax* Smith, Bull U. S. Fish Com., p. 291, pl. LXXIV.

ANIMAL CHARACTERS.

NUTRITIVE STRUCTURES:—Branchial opening with rusty red papillae arranged in two ranks; anal finely crenulated; *supra-anal large with two large tentacular structures on each mantle edge;* inner laminae of inner gills entirely connected; palpi rounded antero-ventrad, connected antero-dorsad two-thirds of their length; color of soft parts tanish, mantle edge antero-ventrad, reddish-brown.

REPRODUCTIVE STRUCTURES:—Marsupium occupying the greater posterior part of the outer gill, consisting of about fifty small ovisacs distended transversely when gravid, and being also distended at the distal ends the ovisacs presenting teat-like appearance; *no mantle flap antero-ventrad to branchial opening,* nor any specialization except for a thickening of the mantle edge; conglutinates not solid, white; glochidium ax-head or hatchet-shape in form, spined, rather small, 0.105 x 0.185mm.

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell rather globose, extremely inflated; disk smooth; beaks extremely full, round, high, sculptured with single tubercles on incurved tips surrounded by fine concentric ridges looped into two or three small tubercular markings at very base of post ridge; epidermis smooth, polished,

brown horn-color, sometimes with yellowish narrow bands parallel to growth lines, rayless.

INTERNAL STRUCTURES:—Cardinals double in right, slightly so in left valve and arranged parallel with laterals; interdentum short; laterals single in right, double posteriorly in left valve; beak and branchial cavities very deep and large, basin-like; nacre white with light rosy pink in branchial cavities, border light bluish.

Sex	Length		Height		Diameter	Locality
♂	10	x	82	x	65mm	(Mississippi R., Hanibal)
♀	95	x	75	x	66mm	(" " ")
♀	66	x	50	x	42mm	(" " La Grange)

MISCELLANEOUS REMARKS:—*Capax* has the most inflated shell of the *Naiades*, yet because of the fact that it is rayless and has no sex dimorphism, nor furrowed beak sculpture, nor pure white nacre of *L. ventricosa* it must be removed far from the latter although its immensely inflated shell would superficially class it near *ventricosa*. Its great inflation is not any greater, however, than that of the relative inflation of the *laevissima* shell in the last stage of its parasitic life. Most of all, anatomical material kept by the writer, shows no mantle flap (*Pl. XXVI, fig. 93 B*) as seen in *L. ventricosa*, nor as to be noted in any *Lampsilis*, and the mantle edge antero-ventrad to the branchial opening is not even as much specialized as in *laevissima*, or *alata;* hence its place perhaps should precede *laevissima*, at least, but is placed last in the grouping under this genus on account of its most peculiarly inflated shell which *may* show an advance over the other species that show the other extreme in possessing a compressed shell in their adult life. *Capax* is very rare shell for this State. It has a rather limited geographical distribution over the whole country; however, Simpson reports it as abundant locally, yet the writer's experience in collecting it for in the Mississippi is that it is rare even there and it was considered a stroke of good fortune to secure glochidially gravid material showing proptera characters.

Genus **Carunculina** Simpson.

(Type, *Unio parvus* Barnes.)

1898—*Carunculina* Simpson (in Baker, p. 109, as section).

1900b—*Carunculina* Simpson. Proc. U. S. Nat. Mus., XXII, p. 563. (as subgenus); 1912b, Ortmann, Car. Mus., VIII, p. 337 (as subgenus).

ANIMAL CHARACTERS:—Branchial opening small with rather

large papillae; anal smooth, supra-anal large, closely connected to anal; inner laminae of inner gills free, more or less, from the visceral mass; palpi small, connected half of their length antero-dorsad; marsupia formed by a few large ovisacs occupying posterior part of outer gills, reniform; branchial edge with a papillose caruncle; conglutinates solid, white, club-shaped, glochidia medium in size, semi-elliptic.

SHELL CHARACTERS:—Shell very small, elliptic, rounded before, rather thick, disk smooth; beaks low, coarsely sculptured by regular concentric bars upcurved behind; epidermis dark cloth-like.

MISCELLANEOUS REMARKS:—This is a good genus as now considered by Dr. Ortmann who treated it at first (1912, p. 337) as a subgenus for *Eurynia*, but even then he was inclined to consider it as merely conventional whether we use it generically or subgenerically. *Carunculina* is remarkable for its smallest sized shells, for its unique beak sculpture and for its peculiarly specialized mantle edge antero-ventrad to the branchial opening. It is well represented in this State by the type, *parva*, and although the writer has not personally collected *tecxasensis* and *glans* yet these two have been reported in such manner that they can be definitely listed.

Carunculina parva (Barnes).

("Liliput Shell.")

Pl. III, Fig. 8c; Pl. XXVII, Figs. 95 A—D.

1823—*Unio parvus* Barnes, Am. Jl. Sci., VI, pl. XIII, fig. 18 (outline).
1900b—*Lampsilis parvus* Simpson, Pr. U. S. Nat. Mus., XXII, p. 564.
1912b—*Eyrynia* (*Carunculina*) *parva* Ortmann, An. Car. Mus., VIII p. 338.

ANIMAL CHARACTERS.

NUTRITIVE STRUCTURES:—Branchial small, directed upward, with few but large papillae; anal also pointed upward, smooth, supra-anal present, closely but definitely connected by mantle edge; inner laminae of inner gills usually free from visceral mass about one-half of their length; palpi comparatively large, connected antero-dorsad about two-thirds of their length; color of soft parts tan-color except for a blackish or reddish border to mantle at branchial opening.

REPRODUCTIVE STRUCTURES:—Marsupia kidney-shaped, con-

sisting of twenty ovisacs, well marked, occupying posterior half of outer gills, somewhat distended transversely and also at distal ends below the original line of sterile marsupium; border of mantle antero-ventrad to branchial opening greatly specialized into a double row of red papillae terminating in a knobbed caruncle, which, under (x87) lens, is cellular—each cell being hexagonal in shape; conglutinates white, discharged whole, club-shaped; *glochidia medium in size, sub-elliptical, hinge line straight, spineless, measures 0.175 x 0.100.*

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell very small, rather thick, elliptical, rounded before, disk without sculpture; beaks low with six coarse regular, parallel bars evenly curved up at foot of post-ridge region; epidermis brownish to reddish or olivaceous, cloth-like female shells broader posterior ends made by more swollen post ventral portion, males with pointed shells.

Sex	Length	Height	Diameter	Locality
*	38 x	23 x	19mm	(Lake Contrary, St. Joseph—)
♂	27 x	13 x	11mm	(Pond, Columbia)
*	25 x	13.5 x	11.5mm	(Lower L. Contrary, St. Joseph)
*	14.5 x	8.5 x	5.5mm	(Singleton Lake, Halls)
*	11.5 x	6.5 x	4.0mm	(" " ")

The writer obtained about forty juveniles, within the range of the last two measurements, in shallow clear water along the northwest shore of Singleton Lake. They were confined to a small space and were traced here and there among a maze of tiny tracks. These juvenile shells differ from the adult by a thinner shell, more pointed posteriorly, a more greenish epidermis, more compressed, and by a coarser beak sculpture which, although arranged the same in its concentric bars curved up posteriorly, yet they extend down well on the center of the disk. (*See Pl. III, fig. 8c*).

MISCELLANEOUS REMARKS:—*The writer is able to bear out the statements of Drs. Sterki and Ortmann that parva is locally hermaphroditic.* In the past three years, hundreds have been collected in nearly all the Northwest Missouri lakes and streams, but not a single one has been found without the marsupial character of gills and the sexually dimorphic female shell. However, the male and female shells appear in Central Missouri. In all specimens

* This symbol (*) would indicate hermaphroditism here.

for this State the writer finds the supra-anal opening present. Its presence has been doubted by some other writers. This pygmied mussel has great vitality. The writer records thirty-eight heart beats per minute—among the most rapid of the *Naiades*. It is one of the most active in its locomotion. Its breeding season show it to be bradytictic. *The writer has been fortunate to secure parva's glochidium and make more of a definite study than has been recorded since Lea left his studies.* (Obs. XIII, 1874, pl. XXI, fig. 2.)

Carunculina texasensis (Lea).

("Texas Shell.")

Not figured.

1857—*Unio texasensis* Lea, Pr. Ac. Nat. Sci. Phila., p. 84; Jl. Ac. N. Sci., IV, 1860, p. 359, pl. XLI, fig. 184.

1862—*Unio bealei* Lea, Jl. Ac. N. Sci., V., p. 204, pl. XXX, fig. 273.

1912b—*Eurynia (Carunculina) texasensis* Ortmann, An. Car. Mus., VIII, p. 339.

ANIMAL CHARACTERS:—The writer not having seen the soft parts of this species quotes Simpson's description:—"Animal with marsupium consisting of a few large ovisacs (8 to 13); inner gills wholly, or in part, free from the abdominal sac; female often having a well developed caruncle on the mantle below the branchial opening."

SHELL CHARACTERS.

EXTERNAL STRUCTURES:—Shell small, rather thick, subinflated, smooth, rounded before, pointed post-dorsad; post-umbonal ridge rather prominent, especially in the female shell, which is shorter, more inflated and not so pointed posteriorly; epidermis a dark slaty color with one or two whitish rest lines; beaks low with coarse concentric bars upcurved at base of post-ridge.

INTERNAL STRUCTURES:—Cardinals double in right, faintly so in left valve; laterals single in both; interdentum lacking; beak and branchial cavities rather shallow and irridescent posteriorly.

Sex	Length		Height		Diameter	Locality
♂	45	x	24	x	17.5,mm	(Lost Creek, Amity)
♀	37	x	20	x	12.0mm	(Lost Creek, Amity)

MISCELLANEOUS REMARKS:—Comparison to some types of *texasensis* from Wimberly Lake, Texas, assures the writer that

the specimens of the above measurements are a near approach, at least, to this species. However, this species is listed for Mo. more on the strength of Mr. Simpson's report of it for Harrison County, Missouri. where the famous author of the "Synopsis of the Naiades" used to reside. He states that *texasensis* ranges north into northern Missouri, southern Illinois and Indiana. This species is a good one and should be shut out of the synonomy of *parva* especially because its posterior end of shell is never evenly rounded, nor is its epidermis as cloth-like and nacre as white as that of *parva*. The sex dimorphism, too, is different, as determined by the above description of shell.

Carunculina glans (Lea).

("Little Purple.")

(*Not figured.*)

1834—*Unio glans* Lea, Tr. Am. Phil. Soc., p. 82, Pl. VIII, fig. 12, Obs. X, 1863 p. 402.

1900b—*Lampsilis glans* Simpson, Pr. U. S. Nat. Mus. XXII, p. 565.

1912b—*Eurynia* (*Carunculina*) *glans* Ortmann, An. Car. Mus., VIII, p. 339.

ANIMAL AND SHELL CHARACTERS:—Since the writer has not secured any actual shells or soft parts for this species the descriptions of these parts do not appear here.

MISCELLANEOUS REMARKS:—The writer would also lay claim to this species for Missouri from Simpson's report of it for the White River, and also from a few scattered reports of it through some local collectors for the Elk River and other Southern Missouri streams. From Lea's description (Obs. X., 1863, pp. 402 and 405) and also from Wilson and Clark's (1912, p. 48) this species falls under this genus. From shells received by the writer in exchange it would seem to be more nearly like a young *P. purpurata*. It is distinguished from *C. parva* in being a wider, shorter, thicker, heavier and more polished shell and also in possessing a prominent post-umbonal ridge and a coppery and purple nacre.

Genus **Eurynia** Rafinesque.

(Type, *Unio recta*, Lamarck.)

18120—*Eurynia* Rafinesque Monog., Ann. Gen. Sci Phys. Brux.; 1900b, Simpson, Pr. U. S. Nat. Mus., XXII, p. 534 (as section); 1912b, Ortmann An. Car. Mus., VIII, p. 336 (as genus).

ANIMAL CHARACTERS:—Siphonal openings well formed; inner laminae of inner gills usually entirely connected to the visceral mass; in male no specialization, but in female the inner edge of mantle antero-ventrad to branchial opening always with well developed papillae, or short tentacles which often extend to the central of ventral edge; marsupium reniform, swollen, consisting of many ovisacs occupying posterior part of outer gill and ventral edges beaded in white or black pigment when gravid; conglutinates white, not very solid; glochidia large or medium in size, semi-elliptical.

MISCELLANEOUS REMARKS:—The special structures on the mantle antero-ventrad to the branchial opening would group this genus among the highest of the *Lampsilinae* from the fact that the aëration of the embryos is well secured through such specialization. Especially because of the number, form and arrangement of the papillae two sub-genera may be marked out. In the following description when the specialized mantle edge is discussed the female is considered.

Sub-genus **Micromya** Agassiz.

(Type, *Unio fabalis* Lea.)

1852—*Micromya* Agassiz, Arch. für Nat., p. 57; 1912b, Ortmann, An. Car. Mus., VIII, p. 337.

ANIMAL CHARACTERS:—Mantle edge antero-ventrad to branchial opening specialized by papillae, both regular and irregular, arranged rather widely separated in a single row but never extending to the middle of the ventral margin; inner laminae of inner gills entirely connected, or more or less free.

SHELL CHARACTERS:—Shell sub-elliptical, small or medium in size; beak sculpture rather double looped-or distinctly sinuate with the posterior sinuation rather open.

MISCELLANEOUS REMARKS:—This sub-genus is represented in this state by three species—all found only in the Ozarks. The type *fabalis* of Lea of *Micromya* is not found anywhere in Missouri. The essential distinction between the two sub-genera, *Micromya* and *Eurynia* (sens. strict.) is in the less extensive and less crowded arrangement of the papillae on the inner edge of the mantle antero-ventrad to branchial opening in the former.

(To be continued.)

THE STORY OF OUR BIRDS THROUGHOUT THE YEAR 1915.

BY BROTHER ALPHONSUS, C. S. C.

(CONCLUDED.)

Time will permit but a glance at a few of the many interesting facts disclosed by the arrival and the departure of our birds in May. There was only one record of the Downy Woodpecker in May—on the 28th; the last record in April was on the 20th; and the species did not reappear until June 25th. This woodpecker closely resembles the White-breasted Nuthatch in its spring migration. The Snowbird departed on May 3, 1915 and on April 28, 1914. My latest record for this species was May 20, which was quite exceptional.

The Hermit Thrush is a species whose stay with us each spring is notably prolonged. Arriving this year on April 9, and departing on May 31, the Hermit Thrush remained 52 days. In 1914 the time was almost identical, the bird leaving one day later, and arriving on the same day. In 1913 the date of departure was May 30. These dates disclose remarkable regularity in the time of departure of the Hermit Thrush.

The Myrtle Warbler arrived this year on April 19 and departed on May 20—a stay of 31 days. This is the hardiest of the warblers, always arriving the earliest in spring and leaving the latest in autumn. The dates of migration for this species in the spring of 1914 were very close to those of the present year—arriving April 18, and leaving May 17.

Some scattered observations made in May will now be given.—May 7.—Young Killdeers out of the nest, and fledged.—May 9.—A Spotted Sandpiper was startled by the report of a gun and the howl of a dog that was shot; the note of the Sandpiper was piercing.—May 11.—Blackburnian Warbler feeding on insects in apple blossoms; uttered its characteristic note at frequent intervals; by this note the bird may be easily known, as well as by its striking plumage.—May 18.—Saw my first Mourning Warbler—no note; moved slowly in elms, flying a few feet at a time.—May 21.—20 species of warblers seen up to date.—3:30 p. m., a Nighthawk resting in a road-way.

Sixty-two species were recorded in June, 1915. They were:

Crow, Blue Jay, White-breasted Nuthatch, Red-headed Woodpecker, Goldfinch, Downy Woodpecker, Song Sparrow, Chickadee, Hairy Woodpecker, Cardinal, Meadowlark, Bluebird, Robin, Killdeer, Red-winged Blackbird, Bronzed Grackle, Flicker, Field Sparrow, Cowbird, Kingfisher, Towhee, Phoebe, Mourning Dove, Vesper Sparrow, Brown Thrasher, Chipping Sparrow, Chimney Swift, Spotted Sandpiper, House Wren, Baltimore Oriole, Warbling Vireo, Yellow Warbler, Catbird, Kingbird, Bobolink, Screech Owl, Barn Swallow, Orchard Oriole, Crested Flycatcher, Indigo Bird, Wood Pewee, Red-eyed Vireo, Dickcissel, Lesser Yellowlegs, Greater Yellowlegs, Yellow-billed Cuckoo, Alder Flycatcher, Cedarbird, Redstart, Maryland Yellowthroat, Nighthawk, Hummingbird, Canadian Warbler, Red-shouldered Hawk, Bank Swallow, Brown Creeper, Bobwhite, Grasshopper Sparrow, Acadian Flycatcher, Herring Gull, Blackburnian Warbler, Loggerhead shrike.

A very curious record, made on June 13, was that of the Brown Creeper. There was no record for this species in May, the bird having departed on April 20. In 1914 there was also no May record, the date of departure having been April 26. These various dates of migration show that the Brown Creeper is not to be looked for even in May. Who can account for its reappearance in June?

The most notable event in the writer's experience in June of this year was his trip to the sand-dunes in northern Indiana. In company with Dr. Nieuwland and another priest, on June 22, I went to a station seven miles beyond Michigan City, named Mineral Springs. From here a walk of about a mile brought us into the region of the dunes. These are a formation of sandhills—some nearly a hundred feet high—with deep gullies at long intervals. Formed by the wind blowing the sand inward from the shore of Lake Michigan, these dunes extend back probably a mile from the water's edge in several parallel ridges, covered mostly with pine trees. Looked at from the distance of a mile, the tops of the highest hills show the sand among the trees. This is perhaps the wildest part of Indiana. We met no person, nor saw any house, in the dune region. It seemed inspiring to think of the long years during which this unique formation has been going on, man playing no part in it, but nature carrying out her God-appointed laws in utter unobstructiveness.

You will be interested to learn just what species of birds were found among the dunes. The following is the list: Hairy Woodpecker, Redstart, Yellow Warbler, Blackburnian Warbler Acadian Flycatcher, Vesper, Field, Song and Chipping Sparrows, Bluebird, Goldfinch, Blue Jay, Crow, Wood Pewee, Mourning Dove, Maryland Yellowthroat, Catbird, Kingbird, Chimney Swift, House Wren, Indigo Bird, Crested Flycatcher, and Herring Gull. Gulls first appeared when we were 20 miles from Michigan City.

I shall always recall this interesting trip to the sand-dunes as one of the most pleasurable I have ever made. What a pity, I have often thought, that the people of Indiana and the people of Chicago do not try to obtain this unique region for a national park.

In July fifty-three species were found this year. They were: Crow, Blue Jay, White-breasted Nuthatch, Red-headed Woodpecker, Goldfinch, Downy Woodpecker, Song Sparrow, Cardinal, Meadowlark, Bluebird, Robin, Killdeer, Red-winged Blackbird, Bronzed Grackle, Field Sparrow, Flicker, Cowbird, Kingfisher, Towhee, Phoebe, Mourning Dove, Vesper Sparrow, Brown Thrasher, Chipping Sparrow, Chimney Swift, Spotted Sandpiper, House Wren, Baltimore Oriole, Warbling Vireo, Yellow Warbler, Catbird, Kingbird, Purple Martin, Bobolink, Screech Owl, Barn Swallow, Orchard Oriole, Crested Flycatcher, Indigo Bird, Wood Pewee, Red-eyed Vireo, Dickcissel, Greater Yellowlegs, Alder Flycatcher, Cedarbird, Maryland Yellowthroat, Hummingbird, Acadian Flycatcher, Loggerhead Shrike, Grasshopper Sparrow, Least Flycatcher, Scarlet Tanager, Yellow-billed Cuckoo.

Some of the more interesting of my observations, made in July, will now be given.—July 5, 4 p. m.—A Crested Flycatcher, perched on a wire fence, facing the breeze, and flying back, mostly to the ground, to catch flies; usually the bird perched sideways, to see the flies on both sides of the fence.—July 13.—Kingbirds bathing—flying from the tops of tall oaks and dipping into the water of a lake.—July 27.—Saw an abino Robin, which had been seen by number of persons about week previously. They reported it as a curious-looking white bird, but did not recognize it as a Robin. As soon as I saw the bird, which was all white (not snow-white, however), I recognized the right species at once. This Robin stayed in the same trees for a number of days longer, just

how long I can not say, for I left Notre Dame soon after the 1st of August.

August of 1915 had the largest number of species of any of the summer months—73. The greater part of this month was spent by the writer at Bankson Lake, four miles from Lawton, Mich. The country around this lake is very hilly, and deep woods abound in the neighborhood. From this difference in the character of the land, certain species of birds, very rare or unknown at this time of the year at Notre Dame, Indiana, are not uncommon in the vicinity of Bankson Lake. These rare species are: both kinds of Yellowlegs, Great Blue Heron, Gnatcatcher, Yellow-throated Vireo, Acadian Flycatcher, and Tufted Titmouse.

On the other hand, some common species found at Notre Dame are wholly absent or very rare near Bankson Lake. Such are: the Blue Jay, Meadowlark. Bronzed Grackle, Cowbird, House Wren, and Purple Martin. Some summers I have found the Purple Martin fairly common in this region, but this year there was only one record for August. The House Wren and Cowbird also had one record; in other years these species were seen oftener. The Bronzed Grackle, which had two records, was not found at all in August, 1914. The Meadowlark, loving a level country, is not seen on the hills of this section. Blue Jays, in small numbers, inhabited the more open woods near Bankson Lake some years ago, but for the past three summers they have not been observed here.

The most favorable place for observation near Bankson Lake is the deep woods, which are very extensive. Here such rare species as the Acadian Flycatcher, Yellow-throated Vireo, Tufted Titmouse and Gnatcatcher are common species. Here, too, the first warblers reappear toward the end of the month. This year I found fewer warblers in August than in 1914. There were seven: the Yellow Warbler, Blackburnian, Black and White, Redstart, Magnolia, Canadian, and Overbird.

The autumn migration begins in August, although a few species may not be found even in this month. Such are the Dickcissel and Loggerhead Shrike. My last record this year for the Shrike was July 15; for the Dickcissel, July 24. The Yellow Warbler departed on August 15; the Orchard Oriole, on August 28; the Maryland Yellowthroat, on August 21; the Grasshopper Sparrow, on Aug. 10. The Blackburnian, and Black and White

Warblers arrived on Aug. 22; the Magnolia Warbler and Red-breasted Nuthatch, on the 26th; the Canadian Warbler and the Ovenbird, on the 29th. On August 30, a flock of Bonaparte Gulls (about 20) appeared, flying over the lake and dipping frequently. This was my first record of this species.

The list of birds found in August is the following: Crow, Blue Jay, White-breasted Nuthatch, Red-headed Woodpecker, Goldfinch, Downy Woodpecker, Song Sparrow, Chickadee, Hariy Woodpecker, Cardinal, Bluebird, Robin, Killdeer, Red-winged Blackbird, Bronzed Grackle, Field Sparrow, Flicker, Cowbird, Kingfisher, Towhee, Phoebe, Mourning Dove, Chipping Sparrow, Chimney Swift, Vesper Sparrow, Spotted Sandpiper, House Wren, Baltimore Oriole, Warbling Vireo, Yellow Warbler, Catbird, Kingbird, Purple Martin, Bobolink, Screech Owl, Barn Swallow, Orchard Oriole, Crested Flycatcher, Indigo Bird, Wood Pewee, Red-eyed Vireo, Greater, and Lesser, Yellowlegs, Alder Flycatcher, Cedarbird, Maryland Yellowthroat, Nighthawk, Hummingbird, Red-shouldered Hawk, Bank Swallow, Acadian Flycatcher, Grasshopper Sparrow, Least Flycatcher, Scarlet Tanager, Yellow-billed Cuckoo, Tree Swallow, Gnatcatcher, Mud Hen, Great Blue Heron, Eave Swallow, Ruffed Grouse, Whip-poor-whill, Brown Thrasher, Blackburnian, Black and White, Magnolia, and Canadian, Warblers, Tufted Titmouse, Redstart, Red-breasted Nuthatch, Overbird, Bonaparte Gull.

September of this year yielded the writer only 50 species, which was a much smaller munber than is usual for this month. They were: Crow, Blue Jay, White-breasted Nuthatch, Red-headed Woodpecker, Goldfinch, Downy Woodpecker, Song Sparrow, Chickadee, Meadowlark, Bluebird, Robin, Killdeer, Bronzed Grackle, Field Sparrow, Flicker, Kingbird, Kingfisher, Phoebe, Mourning Dove, Chimney Swift, Spotted Sandpiper, House Wren, Warbling Vireo, Catbird, Purple Martin, Bobolink, Screech Owl, Barn Swallow, Indigo Bird, Wood Pewee, Lesser Yellowlegs, Cedarbird, Hummingbird, Least Flycatcher, Yellow-billed Cuckoo, Brown Thrasher, Redstart, Black and White Warbler, Magnolia Warbler, Red-breasted Nuthatch, Hermit Thrush, Golden-crowned Kinglet, Black-throated Green Warbler, White-throated Sparrow, Snowbird, Pine Warbler, Sapsucker, Ruby-crowned Kinglet, Brown Creeper, Nashville Warbler.

No record was made in September for the following species:

Hairy Woodpecker, Cardinal, Red-winged Blackbird, Cowbird, Towhee, Sparrow Hawk, Vesper Sparrow, Baltimore Oriole, Crested Flycatcher, Red-eyed Vireo, Alder Flycatcher, Nighthawk, Maryland Yellowthroat, Scarlet Tanager, Balckburnian Warbler. It is difficult to account for the absence of such common species as the Cowbird, Towhee, and Crested Flycatcher. And even in the case of the Baltimore Oriole, I have always made in former years at least one or two records of this species in September. To me nothing in the life of a bird seems more mysterious than its migratory habits. Nearly every species will show, at least occasionally, some marked irregularity in its migration.

The Spotted Sandpiper departed on Sept. 20; the Warbling Vireo, on Sept. 25; the Purple Martin, on Sept. 24; the Bobolink, on Sept. 13; the Barn Swallow, on Sept. 2; the Hummingbird, on Sept. 22; the Redstart, on Sept. 27. The Red-breasted Nuthatch arrived on Sept. 23; the Hermit Thrush, on Sept. 7; the Golden-crowned Kinglet, Black-throated Green Warbler, Snowbird, White-throated Sparrow, on Sept. 21; the Pine Warbler, on the 24th; the Sapsucker, on the 25th; the Ruby-crowned Kinglet, Brown Creeper, and Nashville Warbler, on the 28th.

Some observations made in September:—Sept. 5.—Black and White Warblers creeping and flitting in trees at the edge of an oak grove; saw only young birds.—Sept. 13.—First Meadowlarks reappeared—no record since Aug. 5, when I went to Bankson Lake, Mich.—Sept. 21.—Migration becoming stronger.—Sept. 22, Killdeers plentiful on the shore of a small lake.—Sept. 27.—Golden-crowned Kinglets numerous in oak groves and evergreens.—Sept. 28.—Least Flycatcher, on a wire fence—looks like a diminutive Phoebe.—Very faint call-note of a Catbird in bushes on a roadside.—Brown Thrashers, plentiful in bushes along a road; Ruby-crowned Kinglet and Nashville Warbler here too.

In October, 1915 I found forty-two species. These were: Crow, Blue Jay, White-breasted Nuthatch, Goldfinch, Downy Woodpecker, Song Sparrow, Chickadee, Hairy Woodpecker, Meadowlark, Bluebird, Robin, Killdeer, Bronzed Grackle, Field Sparrow, Flicker, Cowbird, Kingfisher, Mourning Dove, Chimney Swift, House Wren, Catbird, Wood Pewee, Least Flycatcher, Brown Thrasher, Hermit Thrush, Golden-crowned Kinglet, Snowbird, Pine Warbler, Ruby-crowned Kinglet, Brown Creeper, Myrtle Warbler, Yellow Palm Warbler, Fox Sparrow, Towhee,

Phoebe, White-throated, Lark, Savanna, White-crowned, Tree, Sparrows, Red-breasted Nuthatch, Connecticut Warbler.

Species that are usually seen in October, but failed to appear this year were: Red-headed Woodpecker, Cardinal, Red-winged Blackbird, Vesper and Chipping Sparrows, Cedarbird, Yellow-billed Cuckoo, and Screech Owl. The last record of the Red-headed Woodpecker was made on Sept. 19. As we saw at the beginning of our story, this species was present in all of the previous seasons of 1915. This woodpecker was also found in every month of 1914. This was the only year in which I observed the Red-headed Woodpecker throughout the year.

The migrants in October were: Meadowlark, departed on the 21st; Field Sparrow, on the 27th; Flicker, on the 11th; Cowbird, on the 26th; Chimney Swift, on the 2d; Wood Pewee, on the 8th; Least Flycatcher, on the 7th; Brown Thrasher, on the 10th; Hermit Thrush, on the 19th; Ruby-crowned Kinglet, on the 18th; Yellow Palm Warbler, on the 6th; Fox Sparrow, on the 13th; Towhee, on the 20th; Phoebe, on the 20th; White-throated Sparrow, on the 23d; White-crowned Sparrow, on the 17th; Red-breasted Nuthatch, on the 13th; Connecticut Warbler, on the 15th. The Tree Sparrow, the last of autumn migrants to arrive from the north, returned this year on October 25.

October observations.—Oct. 5.—Goldfinches in autumn plumage.—A few notes of a Song Sparrow.—Yellow Palm Warbler in a hedge along a roadside.—Oct. 9.—Red-breasted Nuthatches, plentiful in an oak grove.—Oct. 14.—Saw an albino Field Sparrow—white on rump and sides.—Oct. 15.—Snowbirds becoming plentiful.—Oct. 16, 8:30 am .—Bright and warm.—Birds plentiful and in song.—The air filled with the notes of Bluebirds.—Goldfinches and Towhees, everywhere.—Oct. 19.—Bright and warm.—Meadowlarks singing loud.

My record for November, 1915 shows only 18 species. These were: Crow, Blue Jay, White-breasted Nuthatch, Goldfinch, Downy Woodpecker, Song Sparrow, Cardinal, Bluebird, Robin, Killdeer, Bronzed Grackle, Kingfisher, Golden-crowned Kinglet, Snowbird, Brown Creeper, Myrtle Warbler, Tree Sparrow, Chickadee.

The species most abundant in November were: Crow, Blue Jay, White-breasted Nuthatch, Snowbird, and Chickadee. The less abundant species were: Goldfinch, Killdeer, Downy Wood-

pecker, Tree Sparrow, Bronzed Grackle, Brown Creeper, Golden-crowned Kinglet. The very rare species were: Mytlre Warbler, with two records—the 19th and 23d; the Cardinal, Bluebird, Robin, with one record.

The migrants in November were: Bluebird, and Robin, on the 4th; Kingfisher, on the 23d; Golden-crowned Kinglet, on the 11th; Myrtle Warbler and Killdeer on the 24th. The Golden-crowned Kinglet reappeared on Dec. 20, the only winter record I have ever made for this species. The Cardinal, though not a migrant, was not found after Nov. 10.

Some observations made in November.—Nov. 10, Golden-crowned Kinglets flitting about in a tree, and always looking upwards, probably for insects; did not remain long in one tree.—Nov. 14, Chickadees, plentiful in orchards and woods. They move quickly from tree to tree, feeding on larvae on the bare branches.—Nov. 15, first snowfall last night.—A Killdeer on the shore of a lake; the first time I remember seeing this species in the snow.

I shall now summarize the results this year's observations of bird life. The total number of species seen in 1915 was 117, which was five more than the number found in 1914. Species that were not present in 1915 were: Purple Finch, Northern Shrieke, Snowflake, Pine Grosbeak, Black-billed Cuckoo, Wilson Snipe, Wood Thrush, Winter Wren, Carolina Wren, Yellow-breasted Chat, Swamp Sparrow.

In eleven years I have made only one record of the Yellow-breasted Chat. The Carolina Wren appeared in May and June, 1913, but has not been recorded since then. The Winter Wren is a very rare species at Notre Dame, several records being the result of years of observation. I have often wondered why the Wood Thrush is not a common species with us, only an occasional record is made in spring and autumn. The Black-billed Cuckoo may be found, I am sure, every summer, but it is rare compared with the Yellow-billed Cuckoo. Such species as the Pine Grosbeak and the Northern Shrike may be regarded as accidental visitants to our locality. The Purple Finch is also very erratic in its movements, and may not be found at all in most years. The Snowflake may also be placed in the class of irregular visitants.

The very interesting, but most mysterious, migration of our birds has, in this paper, been necessarily treated in a desultory fashion. Fulness of detail and constant comparison of the various

dates of migration can be given only in special articles on the subject, and without such methodical study no satisfactory results can be obtained. I have in many published articles in the AMERICAN MIDLAND NATURALIST attempted a complete statement of the migratory habits of the birds of Notre Dame, Indiana. To these articles, then, I refer my auditors for an exact account of present conditions of migration.

Thus the story of our birds ends. To have done full justice to the subject would require a volume. I have aimed at giving only a summary of my observations—and this mostly in what related to the distribution and migration of our birds. The more interesting, but not more important, part of a bird's life—its habits—I have barely touched upon, chiefly because hitherto my study of birds' habits has been incidental, and can not be thoroughly done without neglecting the other departments. I hope to take up this part of ornithology when I shall have finished my study of the migration and distribution of our birds.

ENUMERANTUR PLANTAE DAKOTAE SEPTENTRIONALIS VASCULARES.—VI.

ENUMERAVIT J. LUNELL.

The Vascular Plants of North Dakota.—VI.

With Notes by J. Lunell.

504. **Biauricula intermedia** (Guersent) Lunell.

Iberis intermedia Guersent. Bul. Soc. Philom. III, 169, t. 21, (1811).

Occasionally escaped. Leeds.

LEPIDIUM Dioscorides II: 166. Plinius XX: 17. Tour. Els. 184. (1694). Anguillara, Matthioli, etc. Linn. Syst. (1735), Gen. (1737 and 1754).

505. **Lepidium densiflorum** Schrader, Ind. Sem. Gott. 4. (1835).

Lepidium intermedium A. Gray, Man. Ed. 2. (1856).

Leeds, Sheyenne.

506. **Lepidium ramosissimum** A. Nels. in Bull. Torr. Bot. Club. 26: 124. (1899.)

Leeds.

CAMELINA Ruellius, Nat. Stirp. 326. (1543). Crantz, Stirp. Austr. I: 18. (1762). *Myagrum* Diosc.

507. **Camelina sativa** Crantz, l. c.

Myagrum sativum Linn. Sp. Pl. 641. (1753).

Leeds, Butte.

NESLIA Desv. Journ. Bot. 3: 162. (1814).

508. **Neslia paniculata** (Linn.) Desv. l. c.

Myagrum paniculatum Linn. Sp. Pl. 641. (1753).

Leeds, St. John, Minot.

SOPHIA Brunfels, Hist. 3: 170. (1543). Lobelius, Icon. 738. (1581). Ray. Hist. 1. 812. (1686). Adans. Fam. des Pl. II. 417. (1763).

509. **Sophia Chirurgorum** Lobelius Obs. 426 (1576); also Trew. Herb. Blackw. V, t. 440 (1765).

Sisymbrium Sophia Linn. Sp. Pl. 659. (1753).

Descurainia Sophia Webb.; Prantl in Engler & Prantl, Nat. Pfl. Fam. 3: Abth. 2. 192. (1892).

Sophia Lobelii Rupr. Fl. Cauc. 88. (1869).

Sophia Sophia (Linn.) Britt. & Br. Ill. Fl. II: 145. (1897).

The use of the same word to signify both genus and species for a plant is objectionable, and it would simply be unfair not to make the same allowance for varieties. How would this sound: *Sophia Sophia* var. *Sophia?!*

Leeds: Kulm (Brenckle).

510. **Sophia brevipes** (Nutt.) Rydb.

Sisymbrium canescens brevipes Nutt.

Leeds, Peninsula of Lake Ibsen; Kulm (Brenckle).

511. **Sophia filipes** (A. Gray) Heller, in Bull. Torr. Bot. Club. 24: 311. (1897).

Dry bottom of Willow Creek near Dunsieth.

512. **Sophia intermedia** Rydb. in Mem. N. Y. Bot. Gard. I: 184. (1900).

Leeds, Pleasant Lake, Towner.

NORTA Adanson, Fam. des Pl. 417. (1763).

513. **Norta altissima** (Linn.) Britt. Ill. Fl. 2 ed. II. (1913).

Sisymbrium altissimum Linn. Sp. Pl. 659. (1753).

Leeds, and everywhere in the western part of the state.

CHEIRINIA Link, Enum. Hort. Berol. II: 170. (1820).

514. **Cheirinia cheiranthoides** (Linn.) Link. l. c.

Erysimum cheiranthoides Linn. Sp. Pl. 661. (1753).

Leeds, Peninsula of Lake Ibsen.

515. **Cheirinia cheiranthoides** var. **prostrata** Lunell.

Cheiranthus cheiranthoides var. *prostratus* Lunell, in Bull. Leeds Herb. no. 2, p. 6. (1908).

Rolette County: near Dunseith.

516. **Cheirinia inconspicua** (S. Wats.) Rydb. Bull. Torr. Bot. Club 39: 323. (1912).

Erysimum parviflorum Nutt.; T. & G. Fl. N. Am. I: 95. (1838). *Not* Pers. (1807).

Erysimum asperum inconspicuum S. Wats. in King, Geol. Expl. 40th Par. 5: 24. (1871).

In planted farm groves, etc. Leeds.

517. **Cheirinia syrticola** (Sheldon) Lunell.

Erysimum syrticolum Sheldon in Bull. Torr. Bot. Club. 20: 285. (1893).

On the open prairie. Leeds and everywhere.

518. **Cheirinia aspera** (Nutt.) Rydb. Bull Torr. Bot. Club 39: 323. (1912).

Cheiranthus asper Nutt. Gen. Pl. 2: 69. (1818).

Erysimum asperum DC. Reg. Veg. Sept. 2: 505. (1821).

Butte, Oberon, Towner. Minot.

1201. **Cheirinia elata** (Nutt.) Rydb. Bull. Torr. Bot. Club. 39: 327. (1912).

Erysimum elatum Nutt.; T. & G. Fl. N. A. I: 95. (1838).

Cheiranthus elatus (Nutt.) Greene, Pittonia III: 135. (1896).

Thorne.

ERYSIMUM Dioscorides II: 187. Plinius Hist. Nat. Linn. Syst. (1735), Gen. (1737 and 1754). Not Theophrastus = *Polygonum Fagopyrum* Linn. *Sisymbrium* of modern authors, not of the ancients and Dioscorides, which is a *Mentha*.

519. **Erysimum vulgare** Bauhin (Pinax 100. 1623), var. **leiocarpum** (DC.) Lunell.

Sisymbrium officinale leiocarpum DC. Prodr. I: 191. (1824).

Leeds, Devils Lake.

HESPERIS Plinius XXI: 7. Tour. Els. 190. (1694).

520. **Hesperis hortensis** C. Bauhin, Pinax 202 (1623), also Phytopinax 379. (1596).

Hesperis matronalis Linn. Sp. Pl. 663. (1753).

Kulm (Brenckle).

RAPHANUS Theophr. Hist. 7: 4 Diosc. 2: 138. and of all later authors.

Radicula Dodonaeus Pempt. 666. (1583).

521. **Raphanus sativus** Linn. Sp. Pl. 669. (1753).

Escaped. Leeds, Pleasant Lake.

BARBAREA Lobelius, Obs. 104. (1575), Dodonaeus, Pempt. 5: 4: 20. (1583), R. Br., Ait. Hort. Kew. ed. 2. 4: 109. (1812)).

522. **Barbarea vulgaris** R. Br., l. c.

Fargo (Cl. Waldron).

TURRITIS Lobelius, Icones (1591), Dillenius, Gen. 120. (1719), Linn. Syst. (1735).

523. **Turritis hirsuta** Linn. Sp. Pl. 666. (1753).

Arabis hirsuta (Linn.) Scop. Fl. Carn. ed. 2: II: 30. (1772).

Leeds, Butte, Sheyenne.

524. **Turritis brachycarpa.** T & G., Fl. N. Am. I: 79. (1838).

Arabis brachycarpa (T. & G.) Britton, Mem. Torr. Bot. Club V: 174. (1894).

Devils Lake.

525. **Turritis retrofracta** (Graham) Lunell.

Arabis retrofracta Graham, Edinb. Phil. Jour. 349. (1829).

Dunsieth, Towner, Minot.

DRACAMINE Nwd. Am. Midl. Nat. IV: 40. (1915).

Cardamine Clusius, Haller, Lobelius, Linn. Syst. (1735), Gen. (1737 and 1754). Tour. Els. 191. (1694), *not* Dioscorides, which is *Sisymbrium Nasturtium aquaticum* Linn.

526. **Dracamine pennsylvanica** (Muhl.) Nwd. l. c.

Cardamine pennsylvanica Muhl.; Willd. Sp. Pl. III: 486. (1800)

Walhalla (Bergman).

CONRINGIA Link. Enum. Pl. 2: 172. (1822).

527. **Conringia orientalis** (Linn.) Dum. Fl. Belg. 123. (1827).

Brassica orientalis Linn. Sp. Pl. 666. (1753).

Conringia perfoliata Link., l. c.

Leeds, Butte, Pleasant Lake.

ERUCA Mill. Gard. Dict. ed. 8. no. 1. (1768). Tour. Els. 193. (1694).

528. **Eruca latifolia** Bauhin Prod. 39, (1620).

Brassica Eruca Linn. Sp. Pl. 667. (1753).

Eruca Eruca (Linn.) Britt. Ill. Fl. ed. 2. II: 192. (1913).

Eruca sativa Mill. l. c.

Aneta (John Lundquist).

BRASSICA Cicero, Cato, Plinius XIX: 8, XX: 9.

529. **Brassica campestris** Linn. Sp. Pl. 666. (1753).

Fargo (Cl. Waldron).

SINAPIS Dioscorides 2: 154. Theophrastus 7: 3 and 6, Plinius XIX: 68, XX: 22, Brunfels, Dodonaeus, etc., Tour. Êls 193. (1694), Linn. Syst. (1735), Gen. (1737 and 1754).

530. **Sinapis nigra** Linn. Sp. Pl. 668. (1753).

Brassica nigra (Linn.) Koch in Roehl, Deutsche Fl. ed. 3, 4: 713. (1833).

Leeds.

531. **Sinapis arvensis** Linn. Sp. Pl. 668. (1753).

Brassica Sinapistrum Boiss. Voy. Espagne, 3: 39. (1839).

Brassica arvensis (Linn.) B. S. P. Prel. Cat. N. Y. (1888).

Leeds.

HIRSCHFELDIA Fritsch, Exkursfl. Oesterr. ed. 2, p. 265. (1909).

Erucastrum Presl., undesirable name as built on *Eruca*.

532. **Hirschfeldia Pollichii** (Schimp. & Spenn.) Fritsch, Exkursfl., l. c.

Erucastrum Pollichii Schimp. & Spenn., Fl. Freib. III, p. 946. (1829).

Fargo (Cl. Waldron). Well established.

533. **Matthiola sp.**

Occasional escape from cultivation, Leeds.

Family 52. **CAPPARIDEAE** Vent. Tabl. III: 118. (1794.)

JACKSONIA Raf., Med. Repos. V. 352. (1808), *not* R. Br. in Ait. Hort. Kew. III: 12. (1811).

Polanisia Raf. Am. Month. Mag. 267. (1818), also Journ. de Phys. 98. (1819).

534. **Jacksonia trachysperma** (T. & G.) Greene, Pittonia 2: 175. (1891).

Polanisia trachysperma T. & G. Fl. N. A. I: 669. (1840).

Leeds, Narrows.

535. **Jacksonia trifoliata** Raf., Med. Repos. N. Y. l. c.

Polanisia graveolens Raf. Journ. de Phys., l. c.

Polanisia dodecandra B. S. P. Cat. N. Y. 6. (1888), not *Cleome dodecandra* Linn.

In the eastern part of the state.

PERITOMA DC. Prodr. I: 237. (1824).

536. **Peritoma serrulatum** (Pursh) DC., l. c.
Cleome serrulata Pursh, Fl. Am. Sept. 441. (1814)
Cleome integrifolia T. &G. Fl. N. Am. I: 122. (1838).
Leeds, Hurricane Lake.

Family 53. **RESEDACEAE** S. F. Gray, Nat. Arr. Brit. Pl. 2: 665. (1821).

RESEDA Linn. Sp. Pl. 448. (1753).

537. **Reseda odorata** Linn., l. c.
Escaped from cultivation. Leeds.

Order 24. CALOPHYTAE.

Bartling, Ord. Nat. Pl. 330, 398. (1830).

Family 54. **PENTHORACEAE** Rydl. N. Am. Fl. 22: 75. (1905).

PENTHORUM Gronovius, Fl. Virg: 51. (1739). Linn.: Gen. (1742), Act. Ups. (1744).

538. **Penthorum sedoides** Linn. Sp. Pl. 432. (1753).
Fargo (Bergman).

Family 55. **PARNASSIEAE** S. F. Gray, Nat. Arr. Brit. Pl. II: 623. (1821).

PARNASSIA Tour. Els. 212. (1694), I. R. H. 246. (1700). Linn. Syst. (1735), Gen. (1737 and 1754), Haller, Helv. 316. (1742).

539. **Parnassia caroliniana** Michx. Fl. Bor. Am. I: 184. (1803)
Towner.

540. **Parnassia palustris** Linn. Sp. Pl. 273. (1753).
Towner, Butte.

Family 56. **SAXIFRAGEAE** Vent., Tab. III: 277. (1799).

HEUCHERA Linn., Syst. (1735), Gen. (1737 and 1754), Hort. Cliff. 82. (1737).

541. **Heuchera hispida** Pursh, Fl. Am. Sept. 188. (1814).
Leeds, Butte.

Family 57. **GROSSULARIACEAE** Dumort. Anal. Fam. Fl. 37. (1829).

GROSSULARIA Ruellius, Hist. Stirp. 213. (1543). Clusius, Hist. (1605). Tour. Els. 501. (1694), I. R. H. 639. (1700), Miller, Gard. Dict. Abr. (1754).

542. **Grossularia saxosa** (Hook.).
Ribes saxosum Hook. Fl. Bor. Am. I: 231. (1833).
Devil's Lake, Turtle Mountains, Minot.

COREOSMA Spach, Veg. Syst. VI: 154. (1838), also Ann. Nat., Ser. II, IV. 2. (1835).

543. **Coreosma prostata** (L'Her.) Lunell.
Ribes prostratum L'Her, Stirp. Nov. I: 3, Pl. 2, (1784).
Turtle Mountains: Fish Lake.

544. **Coreosma americana** (Miller) Nwd. Am. Midl. Nat. IV: 60. (1915).
Coreosma florida Spach, Veg. Syst. VI: 157. (1838).
Ribes floridum L'Herit. Stirp. Nov. 1, 4. (1784).
Ribes americanum Miller, Gard. Dict. ed. 8. (1768).
Peninsula of Lake Ibsen, Turtle Mountains.

545. **Coreosma tristis** (Pall.) Lunell.
Ribes triste Pall. *Ribes rubrum* var. *subglandulosum* Maxim.
Pleasant Lake, Turtle Mountains.

546. **Coreosma longiflora** (Nutt.) Lunell.
Ribes longiflorum Nutt. Ker. Bot. Reg. 2: pl. 125. (1816).
Medora, Sentinel Butte (Bergman).

Family 58. **SPIRAEACEAE** Loiseleur Delongchamps, Man. Pl. Indig. I: 188. (1818).
SPIRAEA Theophrastus I: 23, Bauhin, Pinax 475. (1623), Clusius, Hist. I: 80. (1605), Tour. Els. 490. (1694).

547. **Spiraea alba** Duroi, Harb. Baumz. II: 430. (1772).
Spiraea salicifolia lanceolata T. & G., Fl. N. Am. I: 145. (1840).
Pleasant Lake.

548. **Spiraea latifolia** (Ait.) Borck. Handb. Forstb. 1871. (1803)
Spiraea salicifolia latifolia Ait. Hort. Kew 2: 198. (1789).
Turtle Mountains.

549. **Spiraea simplex** Greene, Leaflets II. 157. (1911).
Leeds, Butte.

505. **Spiraea Vanhouttei** Zabel. Witm., Gartenzezeit. III, 496 (1884).
Plant under cultivation, with a self-spreading tendency. Leeds.

Family 59. **DRYADEAE** Vent. Tabl. III. 346. Also Bartling, Ord. Nat. Pl. 230. (1830).
PENTAPHYLLUM Dioscorides 4: 72, Theophastus, Hist. 9: 14.

551. **Pentaphyllum concinnum** (Richards.) Nwd. & Lll.
Potentilla concinna Richards., Frankl. 1st Journ. 739. (1823).
Potentilla humifusa Nutt. Gen. I, 310. (1818).
Leeds, Butte; Dickinson (Cl. Waldron).

552. **Pentaphyllum pulcherrimum** (Lehm.) Nwd. & Lll.
Potentilla pulcherrima Lehm. Nov. Stirp. Pugill. 2: 10. (1830).

Leeds, Oberon.

553. **Pentaphyllum viridescens** (Rydb.) Lunell.

Potentilla viridescens Rydb. (Monog. Pot.) Mem. Dept. Bot. Columbia Univ. 2: 43. (1898).

Butte.

554. **Pentaphyllum pennsylvanicum** (Linn.)

Potentilla pennsylvanica Linn. Mant. Pl. 76 (1767).

Leeds.

555. **Pentaphyllum strigosum** (Pursh).

Potentilla strigosa (Pursh) Pall.; Tratt. Rosac. Monogr. 4: 31. (1824).

Potentilla pennsylvanica strigosa Pursh. Fl. Am. Septentr. 356. (1814).

Potentilla arachnoidea Dougl.; Rydb. N. Amer. Fl. 22: 350. (1908).

Leeds, Pleasant Lake.

556. **Pentaphyllum bipinnatifidum** (Dougl.)

Potentilla bipinnatifida Dougl.; Hook. Fl. Bor. Am. I: 188. (1833).

Potentilla pennsylvanica bipinnatifida (Dougl.) T. & G. Fl. N. A. I: 438. (1838).

Leeds, Pleasant Lake.

557. **Pentaphyllum platylobum** (Rydb.)

Potentilla platyloba Rydb. Fl. of Colo. 184. (1906).

Potentilla bipinnatifodd platyloba Rydb. Bull. Torr. Cl. XXX: 143. (1906).

Butte.

558. **Pentaphyllum argyreum** (Rydb.).

Potentilla argyrea Rydb. N. Am. Fl. XXII: 341. (1908).

Antler (Bergman).

559. **Pentaphyllum effusum** (Dougl.).

Potentilla effusa Dougl. :Lehm. Nov. Stirp. Pug. 2: 8. (1830).

Dunsieth.

560. **Pentaphyllum glabrellum** (Rydb.).

Potentilla glabrella Rydb. Mem. Columb. Univ. II: 94. (1898).

Butte (extinct).

561. **Pentaphyllum Hippianum** (Lehm.).

Potentilla Hippiana Lehm. Nov. Stirp. Pugill. 2: 7. (1830).

Potentilla leucophylla Torr. Am. Lyc. N. Y. 2: 197. (1827). *not* Pall. (1773).

Potentilla pennsylvanica Hippiana T. & G. Fl. N. A. I: 438. (1849).

Butte, Sheyenne.

Pentiphyllum is a good genus name for the species here numbered 551–553. For the following (numbered 554–561) it is just as fitting as *Chrysanthermum* is for those of its species having *white* rays!

POTENTILLA Brunfels in C. Bauhin Pinax. 321. (1623). Matthioli, Fuchsius Hist. and Stirp. (1546), Stirp. Hist. 355. (1549), Caesalpinus, De Plantis 557. (1558).

562. **Potentilla Anserina** Linn. Sp. Pl. 495. (1753).

Argentina vulgaris Lam., Fl. Fr. 3. (1778).

Leeds.

563. **Potentilla Anserina concolor** Rydb. Mem. Bot. Col. Coll. 2: 160. (1898).

Argentian argentea Rydb. Bull. Torr. Club. 33: 143. (1906), seems to possess a different, more permanently and deeply silvery dressing, covering all the leaves. In our plant it often happens that some of the leaves are green above, or merely in part silvery.

Leeds.

564. **Potentilla Anserina grandis** T. & G.

Leeds, Butte.

TRIDOPHYLLUM Necker Els. 2: 93. (1790).

565. **Tridophyllum monspeliense** (Linn.) Greene, Leaflets I: 189. (1906).

Potentilla monspeliensis Linn. Sp. Pl. 499. (1753).

Leeds, Butte, Towner.

566. **Tridophyllum pentandrum** (Engelm.) Greene, l. c.

Potentilla pentandra Engelm.; T. & G. Fl. N. A. I: 447. (1840).

Potentilla rivalis var. *pentandra* S. Wats. Proc. Am. Acad. 8: 553. (1873).

Leeds, Butte, Bottineau.

567. **Tridophyllum leucocarpum** (Rydb.) Greene. l. c.

Potentilla leucocarpa Rydb. in Britt. Ill. Fl. U. S. and Canada, Vol. II: 212. (1897).

Potentilla milligrana Engelm.; Lehm. Delect. Sem. Hort. Hamb. 1849. Add. 12. (1849). *Not* Dougl. 1833.

Potentilla rivalis var. *milligrana* S. Wats. Proc. Am. Acad. 8: 553. (1878).

Leeds, Butte.

568. **Tridophyllum paradoxum** (Nutt.) Greene, l. c.

Potentilla paradoxa Nutt.; Torr. & Gray, Fl. N. Amer. I: 437. (1840).

Potentilla supina Am. Authors, not Linn.

Leeds, Peninsula of Lake Ibsen, Devils Lake.

569. **Tridophyllum Nicolletii** (S. Wats.) Greene, l. c.

Potentilla supina var. *Nicolletii* S. Wats. Proc. Am. Acad. 8: 553. (1873).

Potentilla Nicolletii Sheldon, Bull. Nat. Hist. Surv. Minn. 9: 16. (1894).

Leeds.

DRYMOCALLIS Fourr. Am. Soc. Linn. Lyon. II: 16. 371. (1868).

570. **Drymocallis arguta** (Pursh) Rydb. Mem. Dept. Bot. Columbia Univ. 2: 192. (1898).

Potentilla arguta Pursh Fl. Am. Sept. 736. (1814).

Geum agrimonioides Pursh, l. c. (1814), *not P. agrimonioides* Bieb. (1808).

Leeds, Butte.

DASIPHORA Rafinesque, Ant. Bot. 167. (1838).

Pentaphylloides Morison, Ox. 2: 193. (1715), name undesirable as built on *Pentaphyllum*.

571. **Dasiphora fruticosa** (Linn.) Rydb. Mem. Bot. Columbia Coll. 2: 188. (1898).

Potentilla fruticosa Linn., Sp. Pl. 495. (1753).

Sentinel Butte (Bergman).

CHAMERHODOS Bunge (χαμαί to the ground, ῥόδον a rose). This is a poor name! How could this unsightly plant with its almost microscopical flowers impress upon the author's mind the idea of its resemblance to a rose?

Leeds, Butte, Towner, Dunsieth.

572. **Chamaerhodos erecta** Bunge, in Ledeb. Fl. Alt. I: 430. (1829).

FRAGARIA Cuba, Hort. Sanit. (15th century). Brunfels, Herb. Viv. Ic. (J. de Manliis) 2: 173. (1531). Tour. Els. 245. (1694), Linn. Gen. (1737 and 1754).

573. **Fragaria platypetala** Rydb. Mem. Dept. Bot. Columbia Univ. 2: 177. (1898).

Devil's Lake, Turtle Mountains.

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